

REMARKS

Applicant appreciates the detailed examination evidenced by the Official Action mailed March 31, 2006 (hereinafter the "Official Action"). Applicant also appreciates the allowance of Claims 5-10 and the indication that Claims 2 and 4 would be allowable if rewritten as suggested by the Examiner and to overcome the rejection under Section 112 of Claim 4. *Official Action, p. 2.*

In response, Applicant has amended Claim 4 as suggested by the Examiner to address the rejection under Section 112 and has amended Claim 24 to recite in-part "wherein the bottom electrode defines a sidewall of the recess that contacts the protruding portion of the phase changeable layer." Applicant has further provided remarks herein detailing why Doan does not disclose all the recitations of the pending claims. Applicant respectfully submits that the pending claims are patentable for at least the reasons described herein.

Claim 4 has been Amended to Comply with Section 112

Claim 4 stands rejected over the recitations of "the contact hole" at line 8 thereof. *Official Action, p. 2.* Applicant has amended Claim 4 to include an antecedent basis for the recitation of "the contact hole" as suggested by the Examiner. In particular, Claim 4 has been amended to include the recitations of dependent Claim 3 (from which Claim 4 originally depended). Therefore, the present amendment to Claim 4 is being made to address an oversight whereby the recitations of dependent Claim 3 were not included in Claim 4 in Applicant's previous amendment. Accordingly, the rejection of Claim 4 under Section 112 had been overcome by amendment.

Independent Claims 1 and 24 are Patentable Over Doan

Claims 1, 3 and 24 stand rejected under 35 U.S.C. §102 over U.S. Patent Publication No. 2002/0175322 by Doan et al. ("Doan"). *Official Action, p. 2.* Applicant respectfully submits that Doan does not disclose (in accordance with Section 102), for example, the recitations of independent Claim 1:

a bottom electrode having an interlayer dielectric layer thereon, **the bottom electrode having a recess therein** that

extends beyond a boundary between the bottom electrode and the interlayer dielectric; and
a phase changeable layer in the recess including a protruding portion of the phase changeable layer that protrudes into the bottom electrode beyond the boundary, **wherein the phase changeable layer contacts the bottom electrode within confines of the recess.**

Independent Claim 24 includes similar recitations.

Anticipation under § 102 requires that each and every element of the claim is found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Stated another way, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A. 1978). "Anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. *See Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

As shown in the Figures in Doan, the conductive layer 102 (alleged to disclose the recited bottom electrode of the independent claims) **does not include a recess therein**. To the contrary, as shown for example in Figure 18, the recess is above the conductive layer 102 and, therefore, **does not disclose a recess therein** as shown for example in Figure 9 of the present application. Referring to Figure 9 of the present application, the recess in the bottom electrode 52 is formed so that the void extends beyond the insulating layer 54 into the bottom electrode 52 so that **the recess is within the bottom electrode 52.**

In contrast to the recitations of the present claims, Doan shows that the height of the conductive layer 102 is reduced to form a recess, but does not show that the recess is **in the conductive layer 102**. Accordingly, Doan does not disclose a "bottom electrode having a recess therein" as recited in independent Claims 1 and 24.

In addition to the above recitations, Doan also does not disclose "a phase changeable layer that protrudes into the bottom electrode ... within confines of the recess." For example, the phase changeable material shown in Figures 19-21 of Doan does not protrude into the conductive layers 102, but rather, resides on an upper surface thereof. In contrast, as shown for example in Figure 11 of the present application, the phase changeable material 62 protrudes into the lower electrode 52. Accordingly, Doan also does not disclose "a phase changeable layer in the recess including a protruding portion of the phase changeable layer that protrudes into the bottom electrode," as recited in independent Claims 1 and 24.

As stated above, Applicant maintains that Doan does not disclose the recitations of Claim 24, but has further amended this claim to more clearly distinguish the recited subject matter from Doan. In particular, Claim 24 has been amended to recite in-part:

a bottom electrode having an interlayer dielectric layer thereon;
and
a phase changeable layer extending through the interlayer dielectric layer and protruding into a recess in the bottom electrode wherein the phase changeable layer contacts the bottom electrode with confines of the recess, **wherein the bottom electrode defines a sidewall of the recess that contacts the protruding portion of the phase changeable layer,**

recitations which are not disclosed by Doan. Accordingly, Claim 24 is patentable for at least the additional reason that Doan does not disclose that **the bottom electrode defines a sidewall of the recess that contacts the protruding portion of the phase changeable layer.**

Applicant therefore respectfully maintains that independent Claims 1 and 24 are patentable over Doan for at least the reasons described above. Furthermore, dependent Claim 3 is patentable at least per the patentability of independent Claim 1 as described above.

CONCLUSION

Applicant has amended Claim 4 as suggested by the Examiner to address the rejections thereof under Section 112, and has amended Claim 24 to recite in-part that "the bottom electrode defines a sidewall of the recess that contacts the protruding portion of the phase changeable layer." Applicant has also demonstrated that the pending claims are not disclosed by Doan, and, therefore, respectfully requests the withdrawal of all rejections and the allowance of all claims in due course. If any informal matters arise, the Examiner is encouraged to contact the undersigned by telephone.

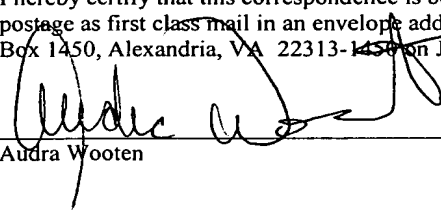
Respectfully submitted,


Robert N. Crouse
Registration No. 44,635

USPTO Customer No. 20792
Myers Bigel Sibley & Sajovec
Post Office Box 37428
Raleigh, North Carolina 27627
Telephone: 919/854-1400
Facsimile: 919/854-1401

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Audra Wooten